



# Discussion Paper BRIEFS

Food Consumption and Nutrition Division of the International Food Policy Research Institute

*Discussion Paper 143*

## **Progress in Developing an Infant and Child Feeding Index: An Example Using the Ethiopia Demographic and Health Survey 2000**

Mary Arimond and Marie T. Ruel

**F**eeding practices are an important determinant of the nutritional status of infants and children. It is therefore useful to measure and describe infant and child feeding practices in a number of contexts. Such measurements could enable (1) international comparisons of the adequacy of infant and child feeding, (2) research linking infant and child feeding to determinants or outcomes, (3) advocacy regarding the importance of adequate infant and child feeding, and (4) monitoring and evaluation of interventions designed to change practices.

This paper reports on progress in developing a summary measure of infant and child feeding practices—the infant and child feeding index (ICFI). The report also addresses two challenges in measuring child feeding practices, namely that infant and child feeding is multi-dimensional, and appropriate practices vary by age of the child.

The authors refine the ICFI and confirm earlier findings that the ICFI is associated with child nutritional status. They also determine which components of the feeding index appear to be most important in driving its association with child nutritional status. Finally, they assess the potential usefulness of the index for the four purposes listed above.

### ***Methodology***

Using the 2000 Ethiopia Demographic and Health Survey, the authors constructed an ICFI that scores a range of key feeding practices for infants and children under 36 months of age: breastfeeding, bottle use, feeding frequency, and dietary diversity. The ICFI score was derived by summing all of the component scores. Age-group-specific terciles were then constructed for the ICFI score.

To understand and accurately represent relationships between infant and child feeding practices and child nutritional status, the authors—using proxies for household socioeconomic conditions—controlled for child, maternal, and household factors that could potentially act as confounding factors.

Finally, the authors simulated the responsiveness of the ICFI to varying levels of change in component indicators. Using summary statistics for each component indicator and spreadsheet formulas, the ICFI was calcu-

lated for a number of different scenarios, each with varied levels of change in component indicators.

### ***Characteristics of the Sample***

With the exception of maternal height and household size, urban and rural households varied substantially on almost all basic characteristics. In general, urban households had more education, greater access to health and prenatal care, greater access to adequate sanitation, and better housing.

Children's anthropometric indicators also confirmed that urban children were significantly better-off, as seen in most developing countries.

Breastfeeding is nearly universal throughout the first year of life for both urban and rural children. Other infant and child feeding practices, however, are less optimal. For example, bottle feeding is widespread, and complementary feeding is often delayed beyond the recommended age of 6 months in both urban and rural areas. Dietary diversity also tends to be low.

### ***Are Infant and Child Feeding Practices Associated with Nutritional Status in Ethiopia?***

Multivariate analysis confirms the statistically significant association between the ICFI and a key indicator of child growth, height-for-age (HAZ). When models were run separately for urban and rural areas, the ICFI was statistically significant only in the rural model. This finding is in line with results of bivariate analyses, which showed no association between the ICFI and child anthropometry in urban areas.

***This revised Infant and Child Feeding Index summarizes a range of age-specific feeding practices, and can be a useful tool for research, communication, and advocacy.***

### ***What Drives the Association Between the ICFI and HAZ?***

The authors examined relationships between HAZ and the individual feeding prac-

tices included in the ICFI, in order to gain insight into (1) which practices drive the relationship between ICFI scores and HAZ, (2) whether the index could be simplified by reducing the number of variables, and (3) why the ICFI was not associated with child nutritional status in the urban subsample.

The results show that dietary diversity clearly drives the association, being strongly and positively associated

with HAZ. Multivariate analyses confirmed that the association between dietary diversity and HAZ remains when socio-demographic factors are controlled for. Frequency of feeding is also positively, though less strongly, associated with HAZ.

In contrast, the other recommended practices (breastfeeding and avoidance of infant feeding bottles) are negatively associated with HAZ, particularly in urban areas. These associations, however, are strongly confounded by education and other household socioeconomic characteristics. The children of wealthier, better-educated women have higher HAZ because they usually live in healthier and more hygienic conditions, and wealthier, better-educated mothers, in turn, are also most likely to either not breastfeed or to stop breastfeeding early, and to use bottles.

These negative associations (between HAZ and good practices) help explain the lack of association between the ICFI and HAZ in urban areas, where most of the wealthier, more educated women live.

The analysis also showed that the relationship between diversity indicators and child nutritional status is very similar whether 24-hour or seven-day recalls are used. The index could thus be simplified by including only one of the recall methods, possibly the 24-hour recall, which is easier to use.

#### ***What Is the ICFI Most Likely to Be Useful For?***

The index summarizes information on feeding practices and can be used to illustrate the strength and magnitude of associations between feeding practices and child outcomes. It may be useful in research exploring determinants and outcomes of practices. It may also be an advocacy tool, useful for communicating the importance of complementary feeding practices to policymakers.

For program monitoring, indicators generally must be very simple so that staff can rapidly gather, summarize, and interpret information. Even in simplified form, the

ICFI does not meet this requirement. For program evaluation, the simplified ICFI—using only the 24-hour data—may be useful. Data on breastfeeding, bottle use, and frequency of feeding are relatively simple to collect and code. Data from 24-hour food group recalls require more work for variable construction but are still relatively easy to use.

To test whether the ICFI derived from the Ethiopia DHS was responsive to changes in its individual components, the authors carried out a simulation exercise, which showed that it accurately reflects the average changes in individual component practices. Thus, the ICFI may be useful for programs that are designed to change most or all component practices, or when program managers are interested in a summary statistic that reflects overall progress toward improving feeding practices. The ICFI should not be used, however, when comparisons are needed between programs—or geographic areas—with differing baseline levels for individual practices, or when some practices included in the index are not targeted by the program.

At present, the ICFI cannot be used for international comparisons, because there are no specific international recommendations for adequate or optimal dietary diversity. This precludes deriving the necessary universal cut-off points to define low, average, or high diversity, which would be needed for international comparisons.

**Keywords:** anthropometry, Demographic and Health Surveys (DHS), infant and child feeding practices, infant and child feeding index

#### **Recent FCND Discussion Papers**

*Social Capital and Coping With Economic Shocks: An Analysis of Stunting of South African Children,*  
Michael R. Carter and John A. Maluccio, December  
2002 **DP142**

**The full text of this document and other FCND Discussion Papers are available on our Website  
([www.ifpri.org/divs/fcnd/dp.htm](http://www.ifpri.org/divs/fcnd/dp.htm)) or via [B.McClafferty@cgiar.org](mailto:B.McClafferty@cgiar.org)**

## **FCND BRIEFS**



International  
Food  
Policy  
Research  
Institute

2033 K Street, N.W.  
Washington, D.C. 20006 U.S.A.

---

***This revised Infant and Child Feeding Index summarizes a range of age-specific feeding practices, and can be a useful tool for research, communication, and advocacy. -DP143***

---